



# Oregon

John A. Kitzhaber, MD, Governor

## Water Resources Department

North Mall Office Building  
725 Summer St. NE, Suite A  
Salem, OR 97301  
Phone: 503-986-0900  
FAX: 503-986-0904  
[www.oregon.gov/owrd](http://www.oregon.gov/owrd)

May 21, 2013

Tim Gross, City Engineer  
City of Newport  
169 SW Coast Highway  
Newport, OR 97365

### **Re: Big Creek Dams (B-28A and B) – Inspection Summary**

I inspected these dams on March 19, 2013, the morning after the presentation of the Phase 1 Seismic analysis of both dams to City Council. The Water Resources Department conducts these routine inspections to identify safety, maintenance or operational issues that may affect dam integrity. Dams are assigned a hazard rating based on downstream hazard to people and property, not on the condition of the dam. Both are classified as high hazard dams, which are inspected annually.

This inspection is put into context of the Preliminary Geotechnical Investigation and Seismic Evaluation conducted for you by HDR Engineering. The results of this inspection are illustrated and described in the following photos and text. This inspection includes recommendations to keep the dam safe and properly working.

### **Results of Inspection:**

#### **Big Creek # 1 (B-28 A)**



Spillway approach

The approach to the spillway is generally clear. There were no logs or debris at the approach or in the reservoir near the dam. There is no log boom, so cleaning the reservoir after a major windstorm would be necessary to protect spillway function.





Spillway control and discharge with fish ladder

The concrete in the control section and down to the discharge was examined. The spillway shows no distress and appears fully functional.



Discharge of low level conduit

I did receive designs for the new conduit from Civil West Engineering. However, they had no information on the current gate structure or trash rack. The plan is to install a 24 inch HDPE liner, with grouting of annular spacing. This is a short term priority for the dam, as is installing an effective gate for this low level conduit.



Upstream face and control works

The upstream face has a full cover of grass, and shows no signs of wave erosion or other distress. Minimum freeboard was 5 feet, which is very good for a 21 foot high dam. There is no significant debris in the reservoir.



Control stem

This control stem may be very important in a seismic event. At the present time, I am unsure of its condition or operation. It is very important to ensure this structure is robust and functional during the work to re-line the low level conduit.





Intake to water treatment plant

This is the intake structure for the water treatment plant. Improvements to this structure necessitated the geotechnical boring and are the reason the seismic issues were discovered. The previous inspection of this dam was conducted during the borehole drilling and seismic cone penetrometer testing.



Downstream face

There is a dense cover of grass effectively preventing erosion on the downstream face of the dam. There is no woody vegetation growing on the dam or on the abutments. The toe of the dam is covered by a large berm which appears to be quite important to the seismic stability of the dam. Seismic stability is still marginal even with the berm, however.



Small area of seepage

The wet area above was just above the toe of the dam, near the center. There was no measurable flow, and for now it is just a watch issue. I will reexamine this site the next time I am at the lower dam.

### **Big Creek 2 (B-28 B)**



Upstream face and spillway intake

Upper Big Creek dam has a reasonable grass cover on the upstream face and crest. These locations show no signs of significant wave erosion or any movement. The dam had a minimum of 8.5 feet of freeboard for the past winter, which is also very good.





Trash rack for morning glory spillway

The principal spillway is a morning glory structure. The trash rack for this structure has a small amount of debris on the grates and floating around the structure.



Outlet of principal spillway

The spillway conduit is a corrugated metal culvert. There was no significant corrosion observed in the culvert but it was only viewed from outside. A view inside this culvert will be attempted during the next routine dam inspection.



Emergency Spillway

The access road serves as a functional emergency spillway for Big Creek # 2 dam, and appears to provide more spillway capacity than the lower dam's spillway.



Control stem with air vent

The control for the low level conduit is supported by an unorthodox and unsecure combination of concrete blocks and boards. It is not sturdy, especially if there is an earthquake. The control stem and structure are both rusty. A permanent and seismically resistant support is essential, in addition to maintenance. Operation of the low level conduit may be essential after an earthquake, with no time available for repairs.





Wet area at toe of dam

The toe of this dam is wet for most of our inspections. I detect no change from inspections at similar water level, nor is there measurable flow leaving this location.



Toe drains

The toe drains seem to be functional. However, the weirs are generally not effective because of downstream high water levels or physical damage.





Downstream face with fish ladder

The downstream face was a little light on grass cover, but there was no erosion or signs of movement observed.



Area of seepage below right abutment

There is one area of seepage below the right abutment. It was also observed in the previous inspection. This seepage bypasses a weir box, as the culvert for that drain is mangled. There is enough water that it should be monitored with a weir box to see if the flow changes.

**Emergency Action Plan (EAP)** The EAP for both dams was completed on June 9, 2009. However, it was not readily apparent at the water treatment plant. It should be in an obvious place. As it is almost four years old, an update is appropriate with a review looking at seismic response and also notification phone numbers. The update should

include more detail on: Inspection procedures (including operator safety) after an earthquake; a safe location for employees in treatment plant; and a plan to communicate safety information to the relatively few residents in the dam breach inundation area so they are prepared in the event of a major earthquake.

**Recommendation(s):**

**Both dams**

- 1) Continue the seismic analysis, and in doing this, consider all options available from a both a water supply and dam safety view.
- 2) Update the Emergency Plan and place it in a location where it is easily available to water treatment plant operators.

**Big Creek 1**

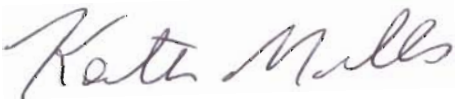
- 1) Watch the small seep in the middle of the dam, and notify me if flow becomes measurable.
- 2) Notify me when the conduit is repaired and ensure repairs address the gate and provide a likelihood of continued operation after an earthquake.

**Big Creek 2**

- 1) Provide permanent support to the control stem and improve its maintenance.
- 2) Install a weir box to collect and monitor flow from the right abutment.

We use a standard inspection form, and a copy of the field inspection sheet for this dam is attached. Please let me know if you have any questions about this inspection. I plan on an inspection this summer if conduit replacement goes as planned.

Sincerely,



Keith Mills, P.E., Dam Safety Engineer  
(503) 986-0840  
Cell (541) 706-0849

C: Barry Norris, State Engineer  
Greg Beaman, Watermaster District 1  
Dam Safety File B-28A





IIIA. Other Instrumentation	<u>  </u> Piezometers	<u>  </u> Inclinometer(s)	<u>  </u> Ground Motion
-----------------------------	-----------------------	---------------------------	-------------------------

Reviewed by dam safety engineer NA Yes No

*None*

IV. Conduit	Control: <u>  </u> Trickle tube <input checked="" type="checkbox"/> Manual Valve <u>  </u> Power Valve <u>  </u> other			Rating
Inlet gate	<u>Submerged</u>			<u>1</u>
Trash Rack	<u>Submerged</u>			<u>1</u>
Control/Stem	Clean Greased Irregular <i>New pump supply</i>			<u>5</u>
Valve(s) cycling	<u>  </u> Frozen <input checked="" type="checkbox"/> unknown <u>  </u> past year <u>  </u> frequent			<u>1</u>
Diameter: <u>30"</u>	Material <u>CMP</u>	Condition <u>Poor</u>		<u>2</u>
Outlet Structure	Overgrown Clean Pressurized Leaking <u>  </u> gpm <i>Submerged</i>			<u>2</u>
Secondary outlet	Yes <input checked="" type="checkbox"/> No <u>  </u> Type <u>  </u> Diameter <u>  </u> in. <i>see above</i>			<u>1</u>

V. Spillway	<u>  </u> Earth <u>  </u> Rock <input checked="" type="checkbox"/> Concrete <u>  </u> Other			
Modifications	<u>None</u> Reduction in capacity Feature not on design			<u>1</u>
Approach Channel	<u>Clear</u> Trees/brush debris sill			<u>4</u>
Flashboards/Gate	None <u>In place</u> operational deteriorated			<u>4</u>
Discharge Channel	<u>Clear</u> Trees/brush leakage headcutting ( <u>  </u> feet approaching control section, depth <u>  </u> ft.)			<u>4</u>
Stilling basin	<u>Not applicable</u> Functional Minor Erosion Severe erosion/Undercutting			<u>1</u>
Aux. Spillway	<u>  </u> Yes <input checked="" type="checkbox"/> No use comments below			<u>1</u>

VI. Access and Security		
Vehicle access	<u>Public road</u> all weather road dirt road cross country	<u>5</u>
Fencing, signage	Remote <u>Clear signage</u> <u>Secure Fence</u> Camera Unsecure	<u>5</u>
On Site Dam Tender/Contact	<u>Yes</u> No Name: <u>Steve / [unclear]</u> Phone: <u>  </u>	<u>4</u>
Emergency Action Plan	<u>  </u> Not required <u>  </u> Completed <u>  </u> at dam (dated <u>  </u> ) <u>  </u> None	<u>3</u>

Comments:

*Issues - crest by spillway, by work  
seep in center of dam  
conduit  
seismic*